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NORTHERN CIRCLE OF THE BOTANICAL SURVEY OF INDIA

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The Northern Circle of the Botanical Survey of India, as constituted at present under the scheme of reorganization of the Botanical Survey of India, includes the states of Jammu and Kashmir, Punjab, Himachal Pradesh, Uttar Pradesh and Delhi, with a total area of more than 264,000 sq. miles, nearly one-eighth of which is covered by forests. Presenting a wide variety of climates, tropical, temperate and frigid, and soil conditions with elevations ranging from a few hundred metres to 7000 metres, perhaps, the limit of all vegetation, the region is extremely rich and varied in its flora. Consequently, that region has been the happy hunting ground for plant collectors from many parts of the world. The forests included in this area are of as many as seven types (Champion 1936) viz., the tropical thorn, the tropical dry deciduous, the tropical moist deciduous (Sal), the sub-tropical pine, the moist temperate, the dry temperate and the Alpine types of forests. The mightiest of the Indian rivers flow in the region and the great plains of the Punjab and Uttar Pradesh possess extensive areas of cultivation. It is thus natural that a region so varied in its climate and vegetation types should attract plant collectors and during the past one hundred and fifty years, several hundreds of thousands of plant specimens have been gathered and deposited in herbaria all over the world.

The Headquarters of the Northern Circle of the reorganized Botanical Survey of India is located in Dehra Dun and explorations are being undertaken in the States under its jurisdiction with a view to developing a Regional Herbarium and also to replenish the Central National Herbarium with fresh collections.

REVIEW OF EARLIER EXPLORATIONS

Jammu and Kashmir

Victor Jacquemont representing the National Museum of France entered Kashmir in 1831, being the first Botanist to do so. He did not live to see the publication of his great collections which, however, was undertaken by J. Cambessedes and J. DeCaisne. These descriptions were published in 1838-40. Jacquemont was followed by Baron Von Huegel and Godfrey Thomas Vigne who visited Kashmir in 1835. Vigne returned to the Valley of Kashmir in 1836 and stayed there till 1838 during which he collected in Deosai plains near Dras and in Astore valley. J. F. Royle sent his collectors to Kashmir during the years 1835-39 and his rich collections were published in London in 1839. Dr. Moorcroft also collected in the Ladakh region and his collections were sent to Wallich and Royle. Lance, a friend of M. P. Edgeworth collected plants for him from Dras and to the north of the snowy barrier across Kashmir. These specimens ultimately found their way to Kew. Falconer, in the year 1837, travelled via Tragobol and the Kishenganga valley to the upper Indus valley across the Indus near Skardo and to Askoli, collecting all the way. Very valuable collections from the western side of Kashmir were obtained by J E. Winterbottom, who in the year 1846 travelled along the mountains to Astore and Skardo in Indus valley and to Gilgit beyond. Thomas Thomson in 1847 visited Leh and the valleys of Nubra and Shyok. Zanskar and the Karakorams beyond the Indus were also among the places visited by him.

In later years, the flora of Kashmir was explored, among others, by Schlagintweit (1855-57), J. L. Stewart (1868) and Henderson and Hume (1873). In the years 1892-93, Duthie was deputed by the Botanical Survey of India to explore and collect plants from Kashmir. His survey was mostly confined to the Botany of Baltistan and Gilgit. His observations are published in the Records of the Botanical Survey of India (1893-94).

The beginning of the present century saw further efforts at the exploration of Kashmir flora. Meebold visited certain parts of the State in 1905 and the list of plants collected by him was published in 1909. In recent years two beautifully illustrated acounts of the flowering plants of Kashmir have appeared. One of these is an illustrated work by B. O. Coventry published in three series (1923-30) listing and figuring one hundred and fifty species. The other is the work by Blatter, "Beautiful Flowering Plants of Kashmir" in two volumes (1927). Among the recent explorers of Kashmir flora, R. R. Stewart has been the most prominent, his explorations extending over a wide range—Gurez, Dras, Warwan, the Kishenganga valley, Gilgit and in Ladakh. In addition, several forest officers stationed in Kashmir have from time to time contributed to the Indian Herbaria, the most important of them being Keshavanand. Mention must also be made of the many published accounts by naturalists and travellers who incidentally refer to the plants met by them. The establishment of the Drug Research Institute in Kashmir and the collection of drug yielding plants by Col. Chopra and his assistants have also contributed to our knowledge of the Kashmir flora. Very recently, in 1956, the Northern Circle of the Botanical Survey of India undertook an exploratory tour in Kashmir, visiting among other places, Khillanmarg, Apharwat, Lidder valley and the Kolohai and Sonamarg glacial valleys.

From the foregoing account, it appears that Kashmir, on account of its various attractions has figured prominently in explorations and most of the accessible parts of the State have been visited at one time or the other. However, several places in Jammu, Pir Panjal range and in Ladakh need to be visited again with a view to enriching the collections in our herbaria.

Punjab and Himachal Pradesh

The establishment of the cantonment at Sabathu and the associated sanatorium at Simla in the early twenties of the nineteenth century may be said to mark the beginning of botanical studies in this part of the country. In 1817, Govan had travelled a short distance into the mountains from Sabathu and in 1818, the Gerard brothers went as far as Shipke via Spiti. A little later Moorcraft travelled via Kangra and Kulu into Lahul before proceeding to Leh. Govan had a nursery, a branch of the Saharanpur garden, at Nahan in Sirmoor State. It may be mentioned here that the Saharanpur garden had been restored by Lord Hastings in 1820 and Govan was placed in charge of the same to be followed by Royle. Maxwell, a friend of Royle collected plants from Kunnawar. Simla in later years became the centre of much botanical activity. Great impetus was given by the Countess of Dalhousie who collected more than 600 species in 1829. Among others who collected in this area about this time were G. W. Trail, Jacquemont, Inglis, the three Gerard brothers, Lord William Hay, Baron Von Huegel and Vicary. The collections made by these found their way into the herbaria at Edinburgh, Liverpool, Vienna, Calcutta, etc. These were followed by the collections of Griffith, General and Mrs. Walker (1844), Hoffmeister, R. S. Simpson (1847), Thomas Thomson and J. W. Grant. The hills around Simla and to the north in Kunnawar had, therefore, received much attention but the same cannot be said of the areas lying west of Simla, though Edgeworth collected in Nandi and Kangra and Parish in Nandi and Kulu in 1847.

In the latter half of the nineteenth century, collections from the Simla area came mostly from Brandis, Gamble, Watt and others. Collett who was an ardent collector prepared material for a flora of Simla which was published after his death under the title "Flora Simlensis". Though the Simla area and Kunnawar had been explored more or less thoroughly, the other parts of the Punjab Himalayas and the hill states had received considerably less attention. Gammie made a tour of the Chamba and Kangra areas and an account of this tour is found in the Records of the Botanical Survey of India (1898).

Among the important works dealing with the flora of the Punjab, published in the early part of this century are Bamber's Punjab Plants (1916), Parker's Forest Flora for the Punjab (1918) and Kashyap's outstanding work on the liverworts of western Himalayas and the Punjab dealing with a group of plants which is so abundant in the Himalayas but yet is so little known. Very recently, there have been published accounts of the Flora of the Kulu, Beas, Parbati and Chandrabhaga valleys by Wynton-Blyth, Jain and others. The Botanical Survey of India also undertook a short exploration tour in the Chamba and Sirmoor districts of Himachal Pradesh in 1957. It may be stated here that a large number of small princely States, now brought under a unified political control, possess extensive forest areas some of which have neither been classified nor explored and exploration in such forests of Himachal Pradesh is therefore necessary, particularly, in view of the fact that these forests are likely to prove possible sources of valuable drug yielding plants.

Uttar Pradesh

The mighty Himalayan ranges have always been a source of great attraction and a challenge to mountaineers and naturalists. Some of the most attractive and picturesque peaks and valleys are to be found in the ranges lying in the Garhwal and Kumaon divisions of Uttar Pradesh. The earliest attempts to probe into the wealth of the flora of these ranges dates back to the last decade of the 18th century. Thomas Hardwicke was the first European to collect in N.W. Himalayas, when on a political mission to the Ruler of Garhwal at Srinagar in 1796, he collected some plants from the Alaknanda valley. Hardwicke and Martin were also pioneers of plant collection in the plains which they did around Meerut while stationed there. Moorcraft made a journey beyond the sources of the Ganges over the Niti Pass and to the sources of Sutlej in Manasarovar and brought back a collection of dried plants. Buchanan also made trips up the Jumna to Agra in 1813 and up Gogra to Gorakhpur in 1814. The resurrection of the Botanical Garden at Saharanpur by Lord Hastings in 1820 brought about an intensification of the botanical activities in the area and the first two directors, Govan and Royle, particularly the latter, obtained the earliest collections. Wallich, not only sent his collectors to the mountains west of Kali river but he himself travelled up the Gangetic plain visiting Hardwar, Dehra Dun and Saharanpur. Jacquemont (1829) and Griffith (1830) also collected here. Meerut was another centre of botanical activity during those days, Finlayson, Vicary, T. Thomson and Edgeworth, all having collected there. T.

Thomson made collections from the Himalayas while stationed in Rohilkhand (1839). Edward Madden made important collections from the Shattul and Burum Passes and later from Pendras Pass (1846) and the Pindari glacier. The most outstanding collections, however, from the Garhwal and Kumaon Himalayas have been those of Strachey and Winterbottom which were made between 1846 and 1849. Among other places, these two Survey Officers visited many river valleys and mountain passes from Almora to Manasarovar and in Garhwal Himalayas. The original list of plants collected by Strachey and Winterbottom which was drawn up in 1852-53 was first published in 1882 and this was later revised and printed in 1906 by Duthie who incorporated in it the results of his own subsequent collections and also of previous collections from the time of Wallich, Royle, Falconer and others.

An important contribution to our knowledge of the flora of the plains was the list of plants published by M. P. Edgeworth in 1866 based on his collections in the Banda District during 1848-49.

In 1882, Sir George King published a list of plants of Garhwal, Jaunsar-Bawar and Dehra Dun and a similar list of Kumaon was published by W. Watson.

In the early part of the present century, the monumental work of Duthie on the flora of the Upper Gangetic plains was published (1903-20). Osmaston (1927) published a forest flora of Kumaon in which more than 800 species have been listed. U. N. Kanjilal, P. C. Kanjilal and B. L. Gupta have contributed very valuable information to our knowledge of the forest flora of the Siwaliks and sub-montane tracts in Oudh, Pilibhit, etc. The successive Botanists attached to the Forest Research Institute have made very important contributions, the names of Gamble, Bor and Raizada standing out prominently in this connection.

Among the recent collections from the Garhwal and Kumaon Himalayas may be mentioned those of Champion (1920) from Kumaon, Holdsworth and Smythe (1931) and Smythe (1937) from the Bhyundhar Valley, the joint expedition of the University of California and Forest Research Institute, Dehra Dun to the Panch Chuli range and the collections made by Ghildyal from north Garhwal. The Northern Circle of the Botanical Survey of India undertook exploration tours during 1957 in the Mana, Vasudhara, Charanapaduka valleys and the Bhyundhar forests in North Garhwal and in the Pindari glacier and Sarju river valley in Kumaon division. The Circle also made a collection of plants from Banda District in 1957.

The flora of Allahabad and its environs have been worked out by G. D. Srivastava and others of the Allahabad University. In a series of recent papers, the Pezizaceae, Clavariaceae, etc., of the fungi of the Mussoorie range have been described by Thind and others of the Punjab University.

The flora of Delhi State has recently been worked out by J. K. Maheswari.

In spite of the fact that the areas included in the State of Uttar Pradesh are fairly well known botanically, opportunities still exist for intensive exploration in the sub-montane tracts of the Himalayas, and in many of the river valleys and mountain ranges with their glacial valleys in the Garhwal and Kumaon divisions. The possibility of obtaining novelties in some of the border areas and at higher altitudes cannot be ruled out. The eastern districts of Uttar Pradesh, particularly the forests of Gorakhpur and Mirzapur also appear to need attention from the botanical point of view.

Nepal

It would not be inappropriate to include in this article a brief reference to the botanical exploration in the Kingdom of Nepal on account of the richness of its flora and its close affinities to the rest of the Himalayan range. The Kingdom of Nepal was virtually closed to all foreigners till about the end of the eighteenth century. William Kirkpatrick was, perhaps, the first European to be received there in 1793. At the beginning of the nineteenth century, Buchanan resided close to Khatmandu and collected plants on a limited scale. After the Nepalese war of 1814-15, Wallich sent two of his collectors to Nepal and the successive British Residents stationed in Khatmandu also employed their own collectors. Wallich himself spent the Winter of 1821 in the Nepâl valley and nearly a century later Burkill traversed along the same route and collected many of the plants which had been previously gathered by Wallich. In between these two visits, there does not appear to be any collection of importance from Nepal and even now many areas in Nepal are botanically unknown. It must, however, be stated here that the numerous mountaineering expeditions have always brought with them plant collections and in recent years many scientific expeditions in Nepal sponsored by foreign countries have gathered very valuable material. The results of the Japanese expedition have already been published and those of the Swiss expeditions of 1952-54 are being published in parts. The British Museum also undertook a similar expedition in 1956. M. L. Banerji of Meerut has been collecting in Nepal during the past few years. The collections made by the foreign expeditions have not been distributed to the Indian Herbaria. The Botanical Survey of India has under consideration plans to send an exploration party to Nepal in the near future.

In preparing this brief account, information in regard to the early botanical history has been obtained mostly from Burkill's recent papers on the subject (1953 & 56). Grateful acknowledgment is made to the authorities of the Forest Research Institute for providing facilities in their Libraries.